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(54) Title: **PEROVSKITE-BASED FUEL CELL ELECTRODE AND MEMBRANE**

(57) **Abstract:** The present invention provides a material suitable for use in a solid oxide fuel cell, wherein the material is of an, optionally doped, double perovskite oxide material having the general formula (I): $(\text{Ln}_a\text{X}_b)_c(\text{Z}^1\text{Z}^2)_d\text{O}_8$ (I) wherein Ln is selected from Y, La and a Lanthanide series element, or a combination of these and X also represents an element occupying the A site of a perovskite oxide and is selected from Sr, Ca and Ba, and Z¹ and Z² represent different elements occupying the B site of a perovskite oxide and are selected from Cr, Mn, Mg and Fe, and wherein a has a value from 0 to 1, preferably, 0.7 to 1.0, b has a value of from 1 to 0, preferably 0.3 to 0, and each of c and d has a value of from 0.25 to 0.75, provided that a + b has a value of 1, and c + d, has a value of 1, and wherein e has a value of from 0.8 to 1, wherein f has a value of from 0.8 to 1, and g has a value of from 2.5 to 3.2. Also provided are SOFCs having an electrode or functional layer of a material or containing a material of the invention, as well as mixed ionic/electronic conducting membranes suitable for use in a syngas reactor or oxygen separator, comprising a layer of a double perovskite material of the invention, and a method of oxidising a fuel in an SOFC having an anode of a double perovskite material of the invention.

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